Listing of Claims

1-21. Cancelled.

22. (previously presented) A pedestal for supporting a substrate during plasma processing, said pedestal comprising:

an electrode configured for generating an electric field;

a chuck disposed above said electrode, said chuck being configured for holding said substrate;

an edge ring disposed above said electrode, said edge ring being configured for shielding said electrode and said chuck; and

an impedance matching layer disposed between said electrode and said edge ring, said impedance matching layer being bonded to said electrode or said edge ring, said impedance matching layer having characteristics or features configured for controlling an impedance between said electrode and a plasma, said impedance being arranged to affect said electric field to improve processing uniformity across the surface of said substrate.

23. (previously presented) The pedestal as recited in claim 22 wherein said impedance is configured to reduce variations in said electric field.

24. Cancelled.

25. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is arranged to control said impedance between said electrode and said plasma at the edge of said substrate.

26. (previously presented) The pedestal as recited in claim 22 wherein said edge ring includes a first portion configured to be disposed between said electrode and said substrate when said substrate is held by said chuck.

27. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is configured to be disposed between said electrode and said substrate when said substrate is held by said chuck.

28. (previously presented) The pedestal as recited in claim 22 wherein said first portion cooperates with said chuck to define an area for receiving a bottom surface of said substrate.

29. (previously presented) The pedestal as recited in claim 22 wherein said edge ring has a second portion extending above said first portion, said first portion being configured to surround an outer edge of said chuck, said second portion being configured to surround an outer edge of said substrate when said substrate is held by said chuck for processing whereby said edge ring cooperates with said chuck to form a recessed portion for accepting said substrate for processing.

30. (previously presented) The pedestal as recited in claim 22 wherein said chuck has an outer periphery that is smaller than an outer periphery of said substrate.

31. (previously presented) The pedestal as recited in claim 22 wherein said impedance matching layer is formed from a dielectric material.

32. (previously presented) The pedestal as recited in claim 22 wherein said chuck, edge ring and impedance matching layer are formed from a dielectric material, wherein the dielectric constant of said edge ring is equal to the dielectric constant of said chuck, and wherein the dielectric constant of said impedance matching layer is different than the dielectric constant of said edge ring and said chuck.

33. (previously presented) The pedestal as recited in claim 22 wherein a first impedance produced through said chuck is different than a second impedance produced through said edge ring, and wherein said impedance matching layer is arranged to adjust said second impedance produced through said edge ring so that said second impedance is substantially equal to said first impedance produced through said chuck.

34. (previously presented) A pedestal for supporting a substrate during plasma processing, said pedestal comprising:

an electrode for generating an electric field between a plasma and said electrode, said electrode having an inner region and an outer region;

a chuck disposed above said inner region of said electrode, said chuck being configured for holding said substrate during processing, said chuck affecting a first impedance between said electrode and said plasma in an area above said inner region of said electrode;

an edge ring disposed above said outer region of said electrode and positioned next to a side of said chuck, said edge ring being configured for shielding at least said electrode from said plasma, said edge ring affecting a second impedance between said electrode and said plasma in an area above said outer region of said electrode;

an impedance matching layer disposed between said edge ring and said electrode and above said outer region of said electrode, said impedance matching layer having characteristics configured to adjust said second impedance so as to improve processing uniformity across the surface of said substrate, said impedance matching layer being configured to match the impedance between said electrode and said plasma at the edge of said substrate with the impedance between said electrode and said plasma at the center of said substrate.

35. (previously presented) The pedestal as recited in claim 34 wherein said chuck is an electrostatic chuck.

36. (previously presented) The pedestal as recited in claim 34 wherein said impedance matching layer is bonded to said edge ring.

37. (previously presented) The pedestal as recited in claim 34 wherein said impedance matching layer is bonded to said electrode.

38. (withdrawn) The pedestal as recited in claim 34 wherein the length and position of said impedance matching layer with respect to said edge ring is adjusted to control said second impedance.

39. (previously presented) The pedestal as recited in claim 34 wherein the impedance matching layer is formed from a material with a dielectric constant, wherein said dielectric constant is adjusted to control said second impedance.

40. (withdrawn) The pedestal as recited in claim 34 wherein the thickness of said impedance matching layer is adjusted to control said second impedance.

41. (previously presented) The pedestal as recited in claim 34 wherein said electrode has an outer periphery that is greater than or equal to the outer periphery of said substrate when said substrate is disposed on said chuck for processing.

42. (previously presented) The pedestal as recited in claim 34 wherein said electric field produces a uniform sheath voltage at the surface of said substrate when said substrate is disposed on said chuck for processing.

43. (previously presented) The pedestal as recited in claim 34 wherein said electrode is coupled to an RF power source configured to supply RF energy to said electrode.

44. (previously presented) The pedestal as recited in claim 34 further comprising a heat transfer system for controlling the temperature of said substrate and said edge ring during processing, said heat transfer system including a first channel extending through said electrode to the interface between said chuck and said substrate, and a second channel extending through said electrode to the interface between said electrode and said edge ring, said heat transfer system being configured to provide a heat transfer medium through said channels.

45. (previously presented) The pedestal as recited in claim 44 wherein said heat transfer medium is a helium gas.

46. Cancelled.

47. (previously presented) The pedestal as recited in claim 34 wherein said inner region of said electrode corresponds to an inner portion of said substrate when said substrate is disposed over said chuck for processing, and wherein said outer region of said electrode corresponds to an outer portion of said substrate when said substrate is disposed over said chuck for processing.

48. (previously presented) A uniformity pedestal for supporting a substrate during processing thereof, said uniformity pedestal comprising:

a first zone configured to be disposed below a first region of the substrate, the first zone having a first impedance when energy is coupled therethrough;

a second zone configured to be disposed below a second region of the substrate, the second zone having a second impedance when energy is coupled therethrough, the second impedance being different than the first impedance; and

an impedance matching layer configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance.

49. (previously presented) A uniformity mechanism suitable for use in a process chamber within which a plasma is ignited and sustained for processing a substrate, the uniformity mechanism comprising:

a first component that produces a first impedance when energy is coupled therethrough;

a second component that produces a second impedance when energy is coupled therethrough, the first impedance being different than the second impedance; and

an impedance matching layer having characteristics configured to adjust the second impedance such that the second impedance is substantially equal to the first impedance, said characteristics including at least one of a thickness, a length, a position, or a material property.

50. (previously presented) The uniformity mechanism as recited in claim 49 wherein the first component is disposed below an inner region of the substrate and wherein the second component disposed below an outer region of the substrate when the substrate is positioned inside the process chamber for processing.

51. (previously presented) The uniformity mechanism as recited in claim 49 wherein the impedance matching layer is disposed below said second component.

52. (previously presented) The uniformity mechanism as recited in claim 49 wherein the uniformity mechanism is configured for supporting the substrate during processing.

53. (previously presented) The uniformity mechanism as recited in claim 49 wherein the first component is a chuck and wherein the second component is an edge ring.

54. (previously presented) The uniformity mechanism as recited in claim 49 further including a third component for generating an electric field.

55. (previously presented) The uniformity mechanism as recited in claim 49 wherein the first and second components are disposed above an electrode.

56. Cancelled.

57. Cancelled.

58. Cancelled.

59. Cancelled.

60. (New) The pedestal as recited in claim 22 wherein the electrode is formed from a conductive material, and wherein the chuck, the edge ring and the impedance matching layer are formed from a dielectric material.

61. (New) The pedestal as recited in claim 60 wherein the dielectric constant of said edge ring is equal to the dielectric constant of said chuck, and wherein the dielectric constant of said impedance matching layer is larger than the dielectric constant of said edge ring and said chuck in order to compensate for increased impedance that exists at the edge of the chuck.

62. (New) The pedestal as recited in claim 22 wherein the electrode is formed from a conductive material, the chuck and the edge ring are formed from a dielectric material, and the impedance matching layer is formed from a semi-conductive or conductive material.

63. (New) The pedestal as recited in claim 22 wherein the impedance matching layer is formed from silicon, silicon oxide, silicon nitride, silicon carbide, quartz, aluminum, anodized aluminum or aluminum oxide.

64. The pedestal as recited in claim 22 wherein the impedance matching layer is entirely planar and parallel with a top surface of the electrode and a bottom surface of the edge ring.

65. The pedestal as recited in claim 22 wherein the impedance matching layer is disposed between the edge ring and the electrode only in the region of the substrate.